

FIG. 1
(Prior Art)

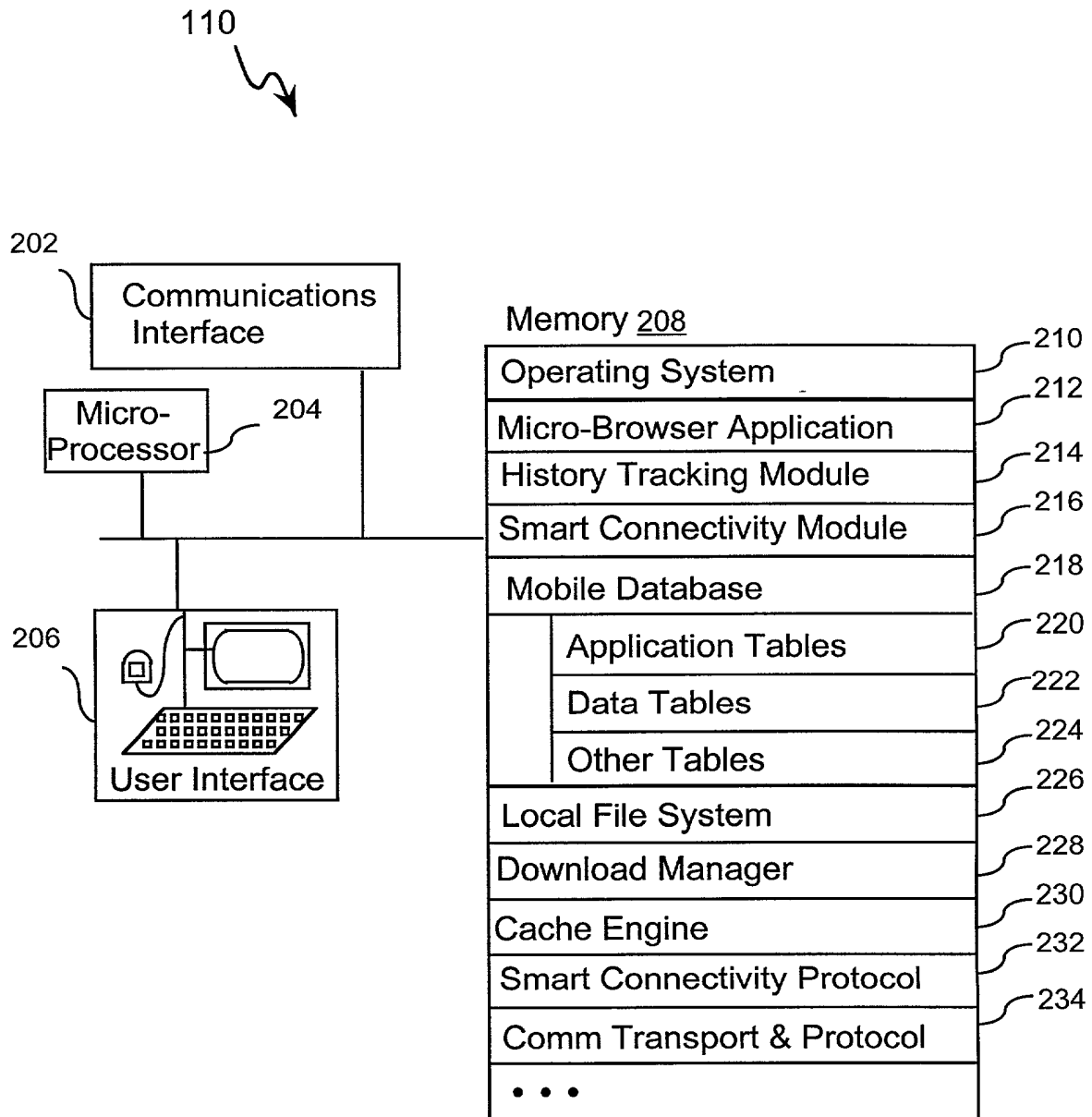


FIG. 2

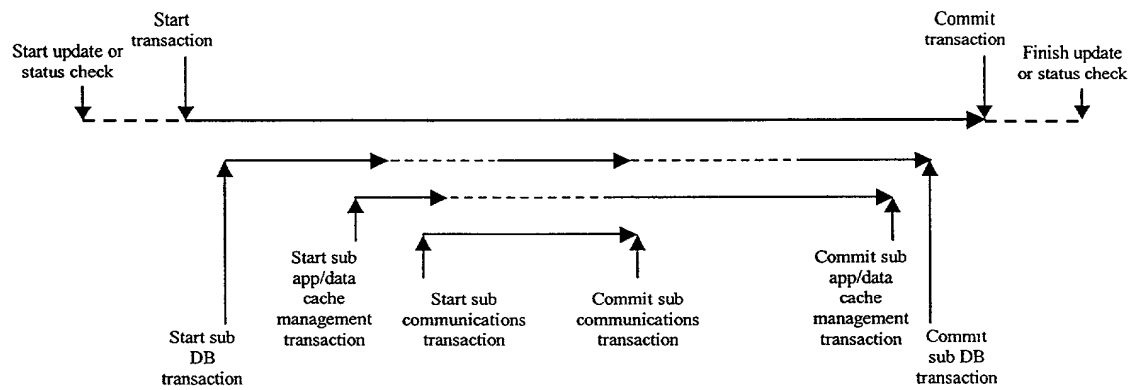


FIG. 3

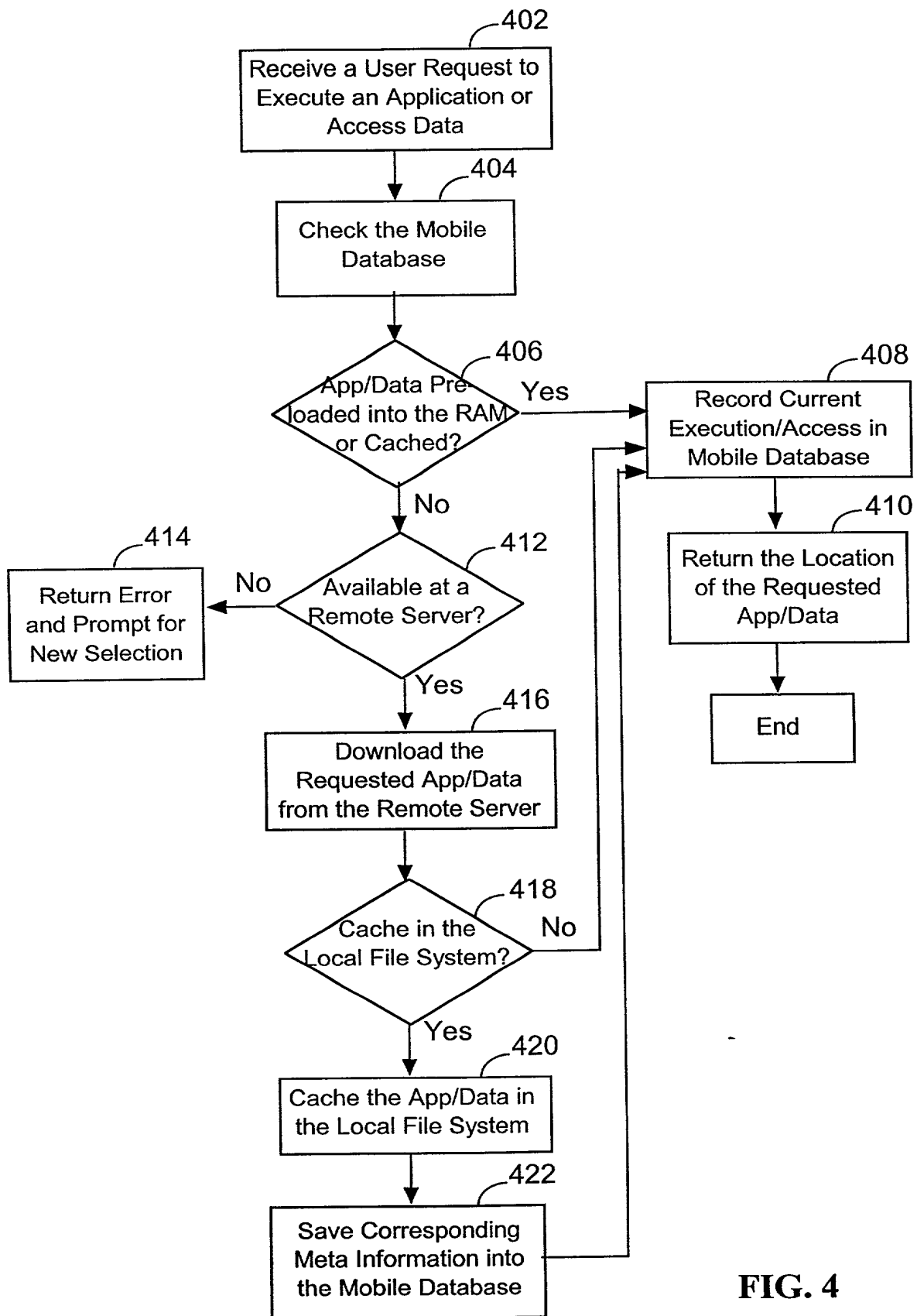


FIG. 4

Application Identification Table

| Column | Data Type | Length | Description |
|--------|------------------------------|-----------------|--|
| appURL | String of unicode characters | Variable length | Application URL, comprising protocol name, host address, path, and application name. Example: http://www.mysite.com/asp/myapp. |
| appID | Unsigned integer | 4 bytes | Unique identifier for the corresponding application URL. |

FIG. 5

Data Identification Table

| Column | Data Type | Length | Description |
|---------|------------------------------|-----------------|---|
| dataURL | String of unicode characters | Variable length | Data URL, comprising protocol name, host address, path, and data file name or a database query. Example: http://www.mysite.com/data/mydata. |
| dataID | Unsigned integer | 4 bytes | Unique identifier for the corresponding data URL. |

FIG. 6

Compression Methods Table

| Column | Data Type | Length | Description |
|----------|------------------|-----------------|---|
| compName | String | Variable length | Data compression method name. |
| compID | Unsigned integer | 1 byte | Unique identifier for the corresponding data compression method ID. |

FIG. 7

Application Download Table

| Column | Data Type | Length | Description |
|-----------|------------------|---------|--|
| appID | Unsigned integer | 4 bytes | Application identifier. |
| appSize | Unsigned integer | 4 bytes | Size in byte of the corresponding application. |
| nDownload | Unsigned integer | 4 bytes | Number of downloads of the corresponding application by the mobile device. |
| timeStamp | Unsigned integer | 4 bytes | The time stamp of the last download of the corresponding application by the mobile device, based on the corresponding mobile device's local clock. |

FIG. 8

Data Download Table

| Column | Data Type | Length | Description |
|-----------|------------------|---------|---|
| dataID | Unsigned integer | 4 bytes | Data identifier. |
| dataSize | Unsigned integer | 4 bytes | Size in byte of corresponding data. |
| nDownload | Unsigned integer | 4 bytes | Number of data downloads of the corresponding data by the mobile device. |
| timeStamp | Unsigned integer | 4 bytes | The time stamp of the last download of the corresponding data by the mobile device, based on the corresponding mobile device's local clock. |

FIG. 9

Application Storage Table

| Column | Data Type | Length | Description |
|------------|--|-----------------|--|
| appID | Unsigned integer | 2 bytes | Application identifier associated with the corresponding application URL. |
| nFile | unsigned integer | 1 byte | Number of files included in the corresponding application. |
| fNames | Array of strings of unicode characters | Variable length | Array of the names of all files included in the corresponding application. |
| appVer | Byte array | 16 bytes | Version information of the corresponding execution of the application. |
| fVers | Array of byte array | Variable length | Array of the version information of all files included in the corresponding application. |
| root | String of unicode characters | Variable length | Root directory in the local storage where the corresponding application is cached. |
| nextRel | Unsigned integer | 4 bytes | Next release time of the corresponding application, based on the corresponding origin application server's local clock. |
| lang | Unsigned integer | 1 byte | Code, indicating the type of computer language used to write the corresponding application. |
| flagSet | Unsigned integer | 1 byte | Flag: <ul style="list-style-type: none"> The 1st bit to 7th bit are reserved; If the 8th bit is on, the corresponding application is out-of-date. |
| nUpdate | Unsigned integer | 2 byte | Number of updates on the corresponding application by the corresponding mobile device since the application has been cached. |
| updateRate | Unsigned integer | 1 byte | Average update rate (1-100 in percentage) for the <i>nUpdate</i> updates on the corresponding application by the corresponding mobile device. |
| CBI | Unsigned integer | 4 bytes | Cache Benefit Index. |

FIG. 10

Data Storage Table

| Column | Data Type | Length | Description |
|----------|------------------------------|-----------------|--|
| dataID | Unsigned integer | 2 bytes | Data Identifier of the corresponding data URL. |
| root | String of unicode characters | Variable length | Root directory in the local storage where the corresponding data is stored. |
| flagSet | Unsigned integer | 1 byte | Flag: <ul style="list-style-type: none"> • If the 1st bit is on, the corresponding application is updated by at least one mobile device. • The 2nd bit to 7th bit are reserved; • If the 8th bit is on, the corresponding application is out-of-date. |
| dataVer | Byte array | 16 bytes | Version information of the corresponding execution of the data. |
| nUpdate | Unsigned integer | 2 byte | Number of updates on the corresponding data. |
| updateRt | Unsigned integer | 1 byte | Average update rate (1-100 in percentage) for the <i>nUpdate</i> updates on the corresponding data. |
| CBI | unsigned integer | 4 bytes | Cache Benefit Index. |

FIG. 11

Application Execution Table

| Column | Data Type | Length | Description |
|-----------|------------------|----------|---|
| appID | Unsigned integer | 2 bytes | Unique identifier for the corresponding application URL. |
| appVer | Byte array | 16 bytes | Version information of the corresponding execution of the application. |
| timeStamp | Unsigned integer | 4 bytes | Time stamp of the corresponding execution of the application, based on the mobile terminal's local clock. |
| peCBI | Unsigned integer | 4 bytes | Per-execution Cache Benefit Index, i.e., the number of bytes saved from wireless communications by caching the application. It is 0 if the application was not cached before the corresponding execution; it is the application size in byte if the application was cached and up-to-date before the corresponding execution; it is the application size in byte, subtracted by the size in byte of the updated part otherwise. |

FIG. 12

Data Access Table

| Column | Data Type | Length | Description |
|-----------|------------------|----------|---|
| dataID | Unsigned integer | 2 bytes | Data Identifier of the corresponding data URL. |
| dataVer | Byte array | 16 bytes | Version information of the corresponding execution of the data. |
| timeStamp | Unsigned integer | 4 bytes | Time stamp of the corresponding access to the data, based on the mobile terminal's local clock. |
| paCBI | Unsigned integer | 4 bytes | Per-access Cache Benefit Index, i.e., the number of bytes saved from wireless communications by caching the data. It is 0 if the data was not cached before the corresponding access; it is the data size in byte if the data was cached and up-to-date before the corresponding access; it is the data size in byte, subtracted by the size in byte of the updated part otherwise. |

FIG. 13

Application cache change table

| Column | Data Type | Length | Description |
|---------|------------------|---------|--|
| applID | Unsigned integer | 2 bytes | Application identifier associated with the corresponding application URL. |
| flagSet | Unsigned integer | 1 byte | Flag: <ul style="list-style-type: none"> • If the 1st bit is on, the application is added to the application caching storage on the mobile device; • If the 2nd bit is on, the application is removed from the application caching storage on the mobile device; • The 3rd bit to 8th bit are reserved. |

FIG. 14

Data cache change table

| Column | Data Type | Length | Description |
|---------|------------------|---------|--|
| dataID | Unsigned integer | 2 bytes | Data identifier associated with the corresponding data URL. |
| flagSet | Unsigned integer | 1 byte | Flag: <ul style="list-style-type: none"> • If the 1st bit is on, the data is added to the data caching storage on the mobile device; • If the 2nd bit is on, the data is removed from the data caching storage on the mobile device; • The 3rd bit to 8th bit are reserved. |

FIG. 15

Configuration Table

| Column | Data Type | Length | Description |
|--------|------------------------------|-----------------|---|
| Name | String of Unicode characters | Variable length | <p>Parameter name. One of the following names is permitted:</p> <p>MAX_CACHE_SIZE: The maximum memory size in byte for the intelligent caching.</p> <p>FREE_MEM_SIZE: The memory size in byte that is free for caching. It is MAX_CACHE_SIZE initially.</p> <p>SRCH_RSLT_SIZE: The maximum number of search result to be received from a gateway at a time. 0 means no limitation for the size.</p> <p>EFFECT_PERIOD: The amount of time application and data records can be stored in the micro DB since the last execution of or access on the corresponding applications or data.</p> <p>APP_CACHE_ROOT: The top-level directory where applications can be cached.</p> <p>DATA_CACHE_ROOT: The top-level directory where data can be cached.</p> <p>NETWORK_TYPE: The wireless network type, either packet-switched network or circuit-switched network.</p> <p>SESSION_TTL: The time-to-live of a newly created logical session, during which, the session may be reused.</p> <p>LAST_APP_ID: The last assigned application identifier. It will be 0 initially.</p> <p>LAST_DATA_ID: The last assigned data identifier. It will be 0 initially.</p> <p>LAST_APP_KEY_ID: The last assigned application-key pair identifier. It will be 0 initially.</p> <p>LAST_UPLOAD_TM: The time stamp for the last successful piggyback of the user operation histories.</p> <p>MAX_QUIET_TM: The maximum amount of time allowed between two user operation histories upload operations. The user operation histories will be uploaded automatically after the amount of time even the user does not create any request to a gateway.</p> <p>COMM_TIMEOUT: The timeout time for a communication message.</p> <p>COMM_RETRY_NO: The permitted number of retries for a communication failure.</p> |
| Value | String of unicode characters | Variable length | Parameter value. It needs to be reinterpreted for different parameter names. |

FIG. 16

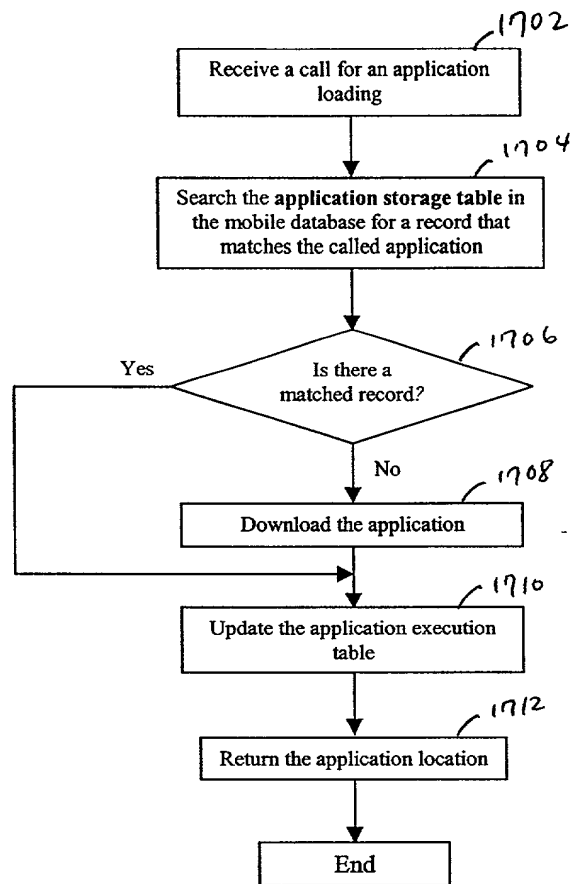


FIG. 17

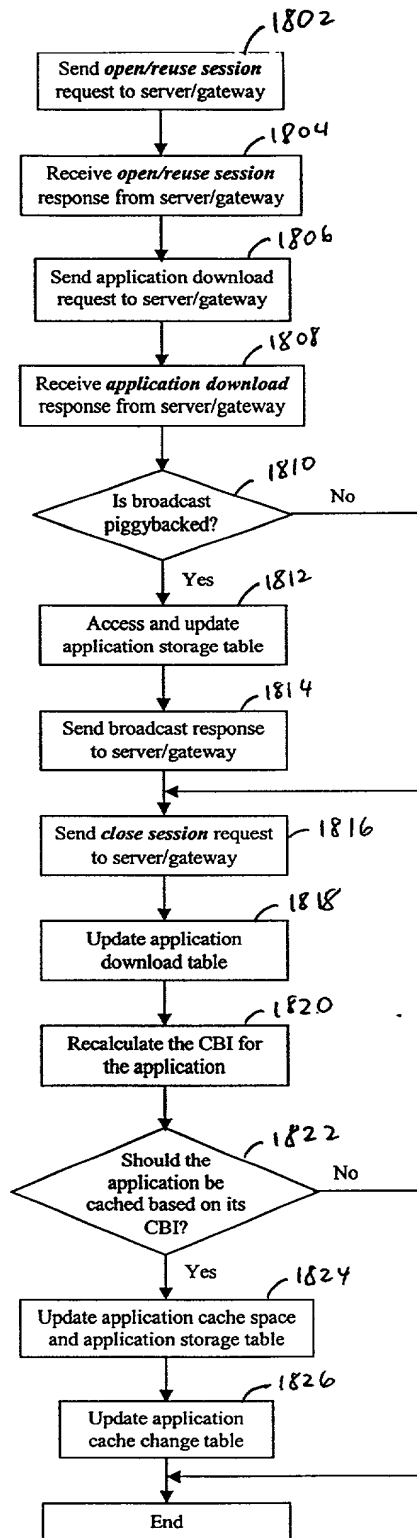


FIG. 18

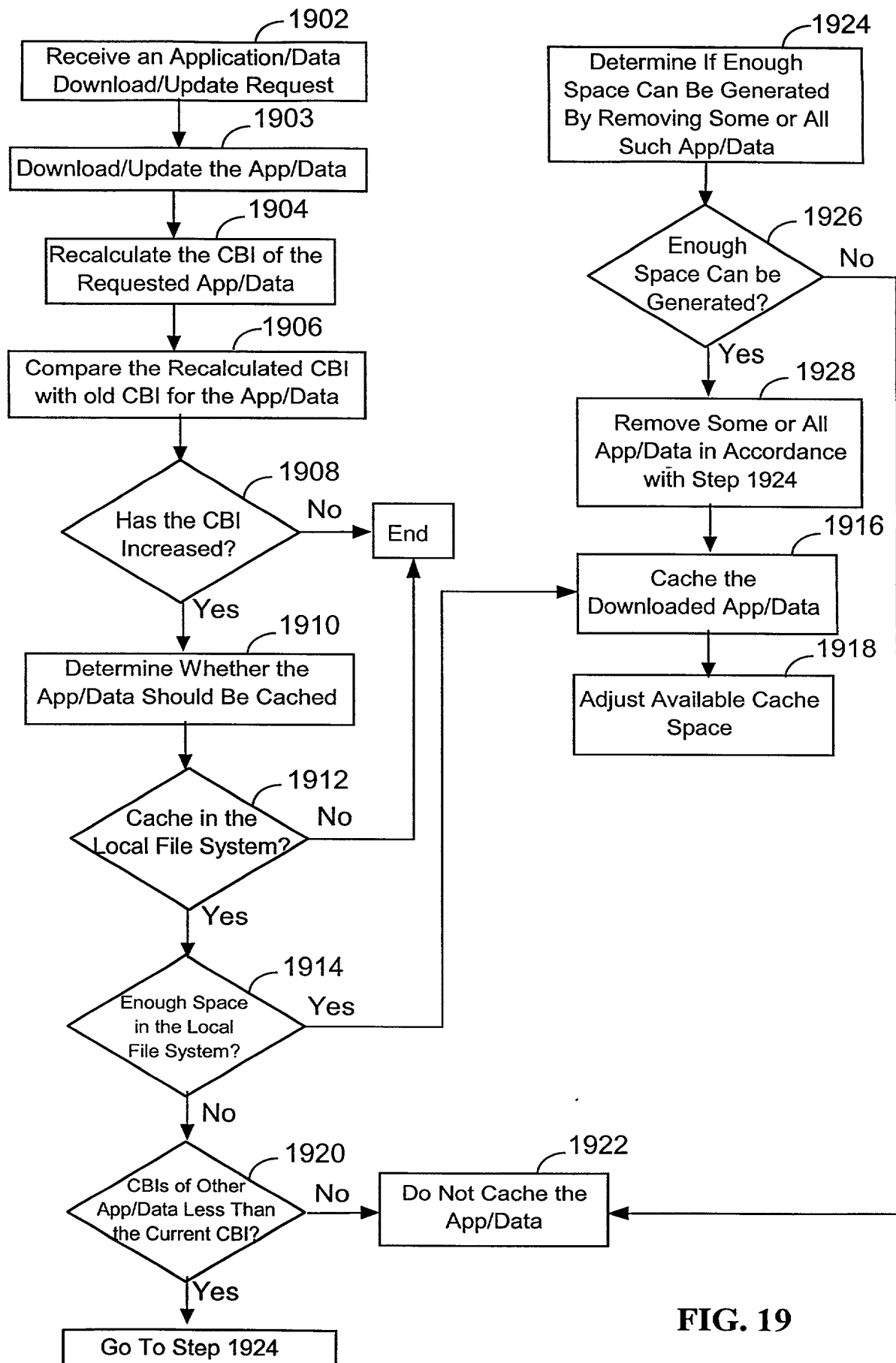


FIG. 19

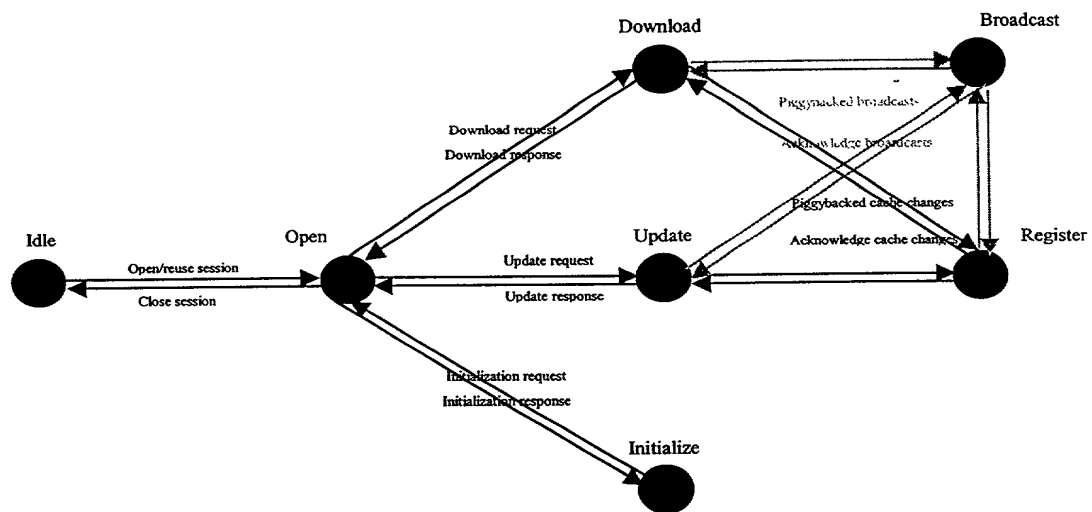


FIG. 20